

Claims

1. A WDM system comprising:

- a first WDM module having a first multiplexer unit for multiplexing a WDM optical signal,

5 - a second WDM module having a first demultiplexer unit for demultiplexing the WDM optical signal, and

wherein the system is arranged, in use, such that optical losses experienced by individual channels of the WDM optical signal in the first multiplexing unit and the first demultiplexing unit and optical losses experienced by the channels during un-amplified transmission between

10 the first and second WDM modules are substantially balanced.

2. A WDM system as claimed in claim 1, wherein the second WDM module further comprises an optical element for tapping off a management signal from one or more of the channels, and the balancing of the optical losses further accounts for effective optical losses experienced by said one or more channels.

15 3. A WDM system as claimed in claim 2, wherein the balance of the optical losses further accounts for a noise impact of the management signal on said one or more channels.

4. A WDM system as claimed in claim 1, wherein the balancing of the optical losses further accounts for effective losses as a result of sensitivities of channel receivers of the second module, and/or limits on transmit powers for the channels.

20 5. A WDM system as claimed in claim 1, wherein the balancing of the optical losses accounts for a nominal 20km fibre insertion loss.

6. A WDM system as claimed in claim 1, wherein the balancing of the optical losses further accounts for physical design parameters of the WDM modules.

25 7. A WDM system as claimed in claim 6, wherein the physical design parameters comprise parameters effecting fibre handling within and outside of the WDM modules.

8. A WDM system as claimed in claim 7, wherein the parameters comprise locations of ports of the WDM modules or locations of filters within the WDM modules.

9. A WDM system as claimed in claim 1, wherein the first multiplexer unit and the first demultiplexer units each comprise a plurality of filter elements, and an order of the filter

elements in the optical path of the WDM signal is chosen to facilitate the balancing of the optical losses.

10. A WDM system as claimed in claim 1, wherein the WDM system is arranged for bi-directional transmission, wherein the first WDM module further comprises a second demultiplexer unit and the second WDM module further comprises a second multiplexer unit, wherein the system is arranged, in use, such that optical losses experienced by individual channels of the WDM optical signal in the second multiplexing unit and the second demultiplexing unit substantially balance optical losses experienced by the channels during un-amplified transmission between the first and second WDM modules.

10 11. A WDM system as claimed in claim 10, wherein the balancing in relation to the first multiplexing unit and the first demultiplexing unit further accounts for the presence of the second multiplexing unit and the second demultiplexing unit and vice versa.

12. A WDM system as claimed in claim 1, wherein the WDM system is arranged as a coarse WDM system (C WDM) with a wavelengths spread greater than 100nm.

15 13. A method of transmitting a WDM signal from a first WDM module to a second WDM module, the method comprising the step of:

- balancing optical losses experienced by individual channels of the WDM signal during multiplexing and demultiplexing at the first and second WDM modules respectively and optical losses experienced by the channels during un-amplified transmission along an optical link between the first and second WDM modules.

20 14. A method as claimed in claim 13, wherein the method further comprise the step of tapping off a management signal from one or more of the channels at the second WDM module, and the balancing of the optical losses further accounts for effective optical losses for said one or more channels.

25 15. A method as claimed in claim 14, wherein the balancing of the optical losses further accounts for a noise impact of the management signal on said one or more channels.

16. A method as claimed in claim 13, wherein the balancing of the optical losses further accounts for effective losses as a result of sensitivities of channel receivers of the second WDM module and/or limits on transmit powers for the channels.

17. A method as claimed in claim 13, wherein the balancing accounts for a nominal 20km fibre insertion loss.

18. A method as claimed in claim 13, wherein the balancing of the optical losses further accounts for physical design parameters of the WDM modules.

5 19. A method as claimed in claim 18, wherein the physical design parameters comprise parameters effecting fibre handling within and outside of the WDM modules.

20. A method as claimed in claim 19, wherein the parameters comprise locations of ports of the WDM modules or locations of filters within the WDM modules.

10 21. A method as claimed in claim 13, wherein the WDM signal comprises a bi-directional WDM signal, and the method further comprises the step of:

- balancing optical losses experienced by individual channels of the bi-directional WDM signal during demultiplexing and multiplexing at the first and second WDM modules respectively, and optical losses experienced by the channels during un-amplified transmission along the optical link between the first and second WDM modules.

15 22. A method as claimed in claim 21, wherein the balancing in relation to the multiplexing and demultiplexing at the first and second WDM modules further accounts for the demultiplexing and multiplexing at the first and second WDM modules respectively, and vice versa.

20 23. A method as claimed in claim 13, wherein the WDM signal comprises a coarse WDM (C WDM) signal with a wavelengths spread greater than 100nm.